

To: rdenison@edf.org[rdenison@edf.org]
From: Richard Denison
Sent: Thur 1/30/2014 10:42:56 PM
Subject: EDF blog post: Should we be holding our breath waiting for more information on risks of the chemical spilled in West Virginia?

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Should we be holding our breath waiting for more information on risks of the chemical spilled in West Virginia?

By [Richard Denison](#) | [Bio](#) | Published: January 30, 2014

Richard Denison, Ph.D., is a Senior Scientist.

A [hearing held yesterday](#) by the West Virginia Legislature's [Joint Legislative Oversight Commission on State Water Resources](#) created quite a stir, when a witness – West Virginia Environmental Quality Board vice-chairman Scott Simonton – said that the human carcinogen formaldehyde had been detected in several water samples drawn from a Charleston, WV, restaurant, and that people in the area affected by the January 9 spill could be expected to have inhaled the chemical, which he identified as a likely breakdown product of the spilled material, crude MCHM. See stories in the [Charleston Gazette](#) and [USA Today](#).

[State officials](#) and the [West Virginia American Water](#) company were quick to call Simonton's claims "unfounded" and "misleading and irresponsible," respectively. The controversy led even the American Chemistry Council – which has laid low ever since the spill – to quickly issue its first statement related to the spill [through its Formaldehyde Panel](#).

While experts are noting that data are insufficient to identify the spill as the source of any formaldehyde detected in the water samples, this new kerfuffle does point to yet another major data gap on crude MCHM.

The one part-per-million (1 ppm) "safe" level state and federal officials set was based on limited data from studies in which rats were exposed to crude or pure MCHM through *oral ingestion*. [Absolutely no data are available](#) on the chemical with respect to exposure through *inhalation*. Yet [officials did not hesitate to tell residents](#) the 1 ppm level would be safe not only for drinking the water, but also for bathing and showering.

(It's curious that the Eastman Chemical Company apparently performed no inhalation studies on crude or pure MCHM, [given that Eastman said its motivation for the studies it did perform was](#)

to understand risks to workers in industrial settings, and its safety data sheet for crude MCHM prominently notes the potential for health concerns for workers from inhalation.)

Clearly the material that spilled is volatile – that’s why people can smell it. Taking a hot shower in such water means that people would clearly be exposed via inhalation of the vapor; how much exposure would occur has not been ascertained. But in the absence of any data as to toxicity of the chemical via inhalation, there is simply no scientific basis on which to say or imply that showering in water contaminated at 1 ppm level was OK.

Chemicals can be more or less toxic by inhalation than by ingestion, with one study finding inhalation to be the more toxic route for half of the chemicals examined and oral ingestion to be the more toxic route for the other half. Benzene, for example, is estimated to be several hundred times more toxic by inhalation than by ingestion, while inhalation of chloroform is estimated to be about 25-fold lower in toxicity than it is by ingestion.

What such comparisons indicate is that extrapolating from data on oral toxicity to predict inhalation toxicity – which is effectively what government officials did in this case – is about as accurate as flipping a coin.

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